As respectfully submitted in the previous Response, independent claim 1 recites a metallization stack in an integrated MEMS device. The metallization stack includes a silicide layer formed on a semiconductor substrate of the integrated MEMS device; a titanium-tungsten layer, formed on the silicide layer, to operatively contact an electrically conductive structure in the semiconductor substrate of the integrated MEMS device, and a platinum layer formed over the titanium-tungsten layer.

In formulating the rejection under 35 U.S.C. §103(a), the Examiner alleges that Tsai et al. discloses a metallization stack that includes a metal silicide layer of platinum, a titanium-tungsten layer formed thereon, and a conductor formed on the titanium-tungsten layer. The Examiner further alleges that Tsai et al. discloses that the titanium-tungsten layer provides a contact to an electrically conductive structure in the semiconductor substrate of the integrated MEMS device. However, as recognized by the Examiner, Tsai et al. fails to disclose that the conductor formed on the titanium-tungsten layer is platinum.

To meet this deficiency in Tsai et al., the Examiner alleges that at the time of the invention copper and platinum were art-recognized equivalents and cites column 5, line 44, of Hart et al. (US-A-5,726,484) to support this allegation. Lastly, the Examiner points to the teachings of Pyke that the Examiner alleges discloses a platinum electrode.

From these various allegations, the Examiner concludes that the presently claimed invention would have been obvious to one of ordinary skill in the art. This conclusion and the various allegations set forth by the Examiner are respectfully traversed.

As recognized by the Examiner, Tsai et al. discloses, in Figure 7, a low contact leakage Schottky diode contact that comprises a metal silicide layer (**28'**) that may consist of platinum, a barrier layer (**34**) that may consist of titanium-tungsten, and a conductor consisting of aluminum, copper, or tungsten.

As noted above, Tsai et al. teaches that the titanium-tungsten layer forms a barrier layer for a Schottky diode. This barrier layer does not provide an operative contact to an electrically conductive structure in the semiconductor substrate of the integrated MEMS device, as is set forth by independent claim 1. Thus, contrary to the Examiner's allegations, Tsai et al. fails to

teach or suggest that the titanium-tungsten layer provides a contact to an electrically conductive structure in the semiconductor substrate of the integrated MEMS device.

Also, as recognized by the Examiner, Tsai et al. fails to disclose that the conductor formed upon the titanium-tungsten barrier layer of Tsai et al. is platinum. However, to meet this recognized deficiency, as stated above, the Examiner alleges that platinum and the various conductor materials taught by Tsai et al. are art-recognized equivalents and cites Hart et al. for support thereof.

Contrary to the Examiner's allegations, the teachings of Hart et al. fail to provide, explicitly or implicitly, any support for the statement that platinum and the various conductor materials taught by Tsai et al. are art-recognized equivalents with respect to the environment of the presently claimed invention or even in the environment taught by Tsai et al.

More specifically, Hart et al. explicitly teaches two conductors made of various conductive materials wherein the various conductor materials include those conductor materials taught by Tsai et al., and platinum. Hart et al. further teaches that the various conductive materials can be readily interchange with each other in an environment where these materials are being used as conductors and an amorphous silicon type antifuse region is located therebetween.

In other words, when an antifuse layer of an oxide layer between the two layers of amorphous silicon is utilized and the antifuse layer physically separates the two conductors, Hart et al. teaches that the conductive materials of the conductors can be interchangeable. Thus, Hart et al. fails to teach, in a global sense, that the conductive materials are always interchangeable, notwithstanding the environment.

More specifically, Hart et al. fails to teach or suggest, expressly or implicitly, that, as in the Schottky diode environment taught by Tsai et al., when a titanium-tungsten barrier layer is located between a metal silicide and a conductor that any of the named conductive materials set forth in column 5, lines 40-45, of Hart et al. can be utilized as the material for the conductor.

Moreover, Hart et al. fails to teach or suggest, expressly or implicitly, that, as in the metallization stack environment taught by the presently claimed invention set forth by independent claim 1, when a titanium-tungsten layer is located between a metal silicide and a conductor that any of the named conductive materials set forth in column 5, lines 40-45, of Hart et al. can be utilized as the material for the conductor.

Therefore, it is very clear from the teachings of Hart et al. that the Examiner's global pronouncement that platinum and the various conductor materials taught by Tsai et al. are art-recognized equivalents cannot be supported from the explicit teachings of Hart et al.

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Lastly, the Examiner has purposely failed to give any patentable weight to the limitations directed to the silicide layer being formed on a semiconductor substrate of the integrated MEMS device and the titanium-tungsten layer operatively contacting an electrically conductive structure in the semiconductor substrate of the integrated MEMS device. These limitations are explicitly recited in the body of independent claim 1, following the preamble.

Since the phrase, "integrated MEMS device," appears in the preamble, and notwithstanding the fact that specific limitations directed to an integrated MEMS device also are recited throughout the body of independent claim 1, the Examiner alleges that the phrase, "integrated MEMS device," provides no meaning to independent claim 1 because the portion of the claim following the preamble is a self-contained description of the structure, not depending for completeness upon the preamble. The Examiner cites Kropa v. Robie, a situation where the only mention of the language at issue was in the preamble, as controlling the present situation.

In the present situation, as recognized by the Examiner, the portion of the claim following the preamble is a self-contained description of the claimed device. This self-contained description of the claimed device includes language indicating that the various layers of a metallization stack are physically tied or connected to an integrated MEMS device because claim 1 explicitly recites that the metallization layer is formed on the substrate of an integrated MEMS device.

Moreover, this self-contained description of the claimed device includes language indicating that the various layers of a metallization stack interact with components of an integrated MEMS device because claim 1 explicitly recites that that the titanium-tungsten layer of the metallization stack operatively contacts an electrically conductive structure in the semiconductor substrate of the integrated MEMS device. This language, explicitly recited in the body of claim 1, is needed to complete the description of the claimed device.

As set forth in independent claim 1, the various layers of a metallization stack are not situated in a vacuum, but the various layers of a metallization stack have a specific inter-relationship with an integrated MEMS device, and the various layers of a metallization stack

provide functional interaction with the integrated MEMS device, namely the titanium-tungsten layer provides operative contact with an electrically conductive structure in the semiconductor substrate of the integrated MEMS device.

Therefore, since it is readily clear that each and every explicitly recited limitation in the body of independent claim 1 gives life and meaning to independent claim 1, it is improper for the Examiner to ignore the explicit limitations directed to an integrated MEMS device and the inter-relationship between the various layers of the metallization stack and the integrated MEMS device.

With respect to the teaching of Pyke, Pyke fails to teach or suggest that the conductive layer, formed upon a titanium-tungsten layer that provides operative contact with an electrically conductive structure in the semiconductor substrate of the integrated MEMS device, comprises platinum, as set forth by independent claim 1.

Moreover, Pyke fails to teach or suggest that the various layers of a metallization stack are formed on a substrate of an integrated MEMS device and fails to teach or suggest that a titanium-tungsten layer that provides operative contact with an electrically conductive structure in the semiconductor substrate of the integrated MEMS device, as set forth by independent claim 1.

Main argument

As has been clearly demonstrated above, Tsai et al., Hart et al., and Pyke, singly or in combination, fail to teach or suggest that the conductive layer, formed upon a titanium-tungsten layer that provides operative contact with an electrically conductive structure in the semiconductor substrate of the integrated MEMS device, comprises platinum, as set forth by independent claim 1.

Moreover, as has been clearly demonstrated above, Tsai et al., Hart et al., and Pyke, singly or in combination, fail to teach or suggest that the various layers of a metallization stack are formed on a substrate of an integrated MEMS device and fails to teach or suggest that a titanium-tungsten layer that provides operative contact with an electrically conductive structure in the semiconductor substrate of the integrated MEMS device, as set forth by independent claim 1. Thus, one of ordinary skill in the art would find the presently claimed invention, as set forth by independent claim 1, obvious under 35 U.S.C. §103(a).

Accordingly, in view of the above remarks, the Examiner is respectfully requested to reconsider and withdraw this rejection. Also, an early indication of allowability is earnestly solicited.

Respectfully submitted,

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Attachments